

Application No. 09/863,811  
Reply to Office Action dated January 14, 2004

### REMARKS

Claims 1-11 and 13-20 will be pending upon entry of the present amendment. Claims 1 and 11 are being amended. Claim 12 is being canceled. Claims 14-20 are new.

The applicants respectfully submit that the Office Action was made final prematurely and request reconsideration of the finality of the Office Action. In the first Office Action dated June 5, 2003, the Examiner indicated that claim 7 was directed to allowable subject matter. The applicants responded by adding new claim 13 and indicating that claim 13 included the subject matter of original claim 7. In the present Office Action, claims 7 and 13 are rejected based on a newly found reference. The placement of claim 7 in independent form as claim 13 could not have necessitated the search for the new reference, and thus, the present Office Action should not have been made final. As a result, the applicants request entry of the present amendment.

Claims 1-13 were rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,600,641 to Oglesbee et al. ("Oglesbee").

Oglesbee does not teach or suggest the invention recited in claims 1-10, as amended. Amended claim 1 recites a protection device that includes a switching element having an input coupled to an output of a thermal detection element and adapted to turn off a cut-off element when the temperature of a parallel protective element detected by the detection element exceeds a predetermined threshold. Oglesbee does not teach or suggest such a switching element. Instead, Oglesbee shows a shunt regulator 104 that monitors the voltage across a parallel switch 104 and opens a series transistor 102 when the monitored voltage exceeds a threshold, without employing a switching element between the shunt regulator 104 and the series transistor 102 (col. 2, line 51 – col. 3, line 4). Oglesbee also shows a silicon-equivalent PTC circuit 106 that causes the series transistor 102 to open when the temperature reaches a predetermined threshold, without employing a switching element between the PTC circuit 106 and the series transistor 102 (col. 3, lines 15-32).

Although Figure 2 of Oglesbee appears to show the shunt regulator 104 being coupled to the series transistor 102 through the PTC circuit 106, a current limit circuit 107, and a protect fuse circuit 108, Figures 4-5 show that at least the protect fuse circuit 108 is not

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connected to the shunt regulator 104, the PTC circuit 106, or the current limit circuit 107. Figures 4-5 are detailed circuit diagrams of the protect fuse circuit 108 which receives a current input 401 from a pass transistor, a threshold voltage input 402, and an input from a series fuse (Fig. 5) that appears to correspond to the series fuse 109 of Figure 1. As such, none of the elements of Figures 4-5 can satisfy the "switching element" language of claim 1, which requires that the switching element have an input coupled to an output of the thermal detection element.

The applicants disagree with the Examiner's assertion that the control circuit 103 of Figure 1 corresponds to the switching element recited in claim 1. As mentioned above, claim 1 recites that the switching element includes an input coupled to the output of a thermal detection element. The Examiner identifies both the shunt regulator 104 and the PTC circuit 106 as corresponding to the thermal detection element, but neither circuit 104, 106 has an output coupled to an input of the control circuit 103. In fact, the only inputs of the control circuit 103 shown in Oglesbee are those mentioned above with respect to Figures 4-5, which are not connected to the outputs of the shunt regulator 104 or the PTC circuit 106.

For the foregoing reasons, claim 1 is nonobvious in view of Oglesbee.

Claims 2-10 depend on claim 1, and thus, are nonobvious for the reasons expressed above. In addition, claims 2-8 and 10 recite additional elements that are not taught or suggested by Oglesbee. In particular, claim 2 recites that the switching element is a normally-off bidirectional element, which cannot be suggested by Oglesbee because Oglesbee does not even suggest the switching element of claim 1.

Oglesbee does not teach or suggest the elements of claims 3-7 which recite that the cut-off element includes two cut-off thyristors in antiparallel and *each having a resistor connected between its anode and cathode gates*. Oglesbee does not teach or suggest any thyristors or resistors connected to thyristors. The Examiner asserts that back to back thyristors are considered equivalent to a bi-directional transistor. Regardless of whether the Examiner's assertion is true, the Examiner has not pointed to anything in Oglesbee or the known skill in the art teaching that resistors should be connected between the anode and cathode gates of the thyristors.

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Oglesbee does not teach or suggest the elements of claims 4-7 which recite that the switching element includes a cathode-gate thyristor and an anode-gate thyristor that are respectively associated with the anode and cathode gates of the cut-off thyristors. Again, Oglesby does not teach or suggest the switching element of claim 1 or any thyristors, so cannot possibly suggest the thyristors connected as recited in claims 4-7. Further, the Examiner has not pointed to anything known in the art suggesting that a cathode-gate thyristor and an anode-gate thyristor should or can be respectively associated with the anode and cathode gates of a cut-off thyristors.

Claims 5-7 recite further details of the switching element and further elements including a resistive dividing bridge having a thermistor (claim 5), a resistive dividing bridge and respective series connection of diodes (claim 6), and a diode (claim 7). These additional elements are clearly not taught or suggested by Oglesby and the Examiner does not even reference these elements in the Office Action.

Claims 8 and 10 recite various elements of the protection device that are integrated in semiconductor substrate. The only reference found in Oglesbee to an integrated circuit explicitly states that it would be difficult to realize the circuit of Figure 3 in a silicon integrated circuit (col. 4, lines 61-67). That teaching away from integration cannot possibly suggest integrating a cut-off element, a temperature detection element, and a switch element (claim 8) or integrating a temperature detection element and a parallel protection element (claim 10).

For the foregoing reasons, claims 2-10 are in condition for allowance.

Oglesbee does not teach or suggest the invention recited in claim 11. Claim 11 recites a protection circuit that includes "a normally-off switching element coupled to the temperature detection element to receive a signal when a temperature sensed by the temperature detection circuit is above a threshold value, the switching element being structured to turn on in response to the signal and output a signal to the cut-off circuit which turns off the cut-off circuit and disconnects the main power from the protection element." As discussed above with respect to claim 1, Oglesbee does not teach or suggest any switching element between a temperature detection circuit and a cut-off circuit. Further, Oglesbee does not teach or suggest any

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"normally-off switching element" or a switching element that outputs "a signal to the cut-off circuit which turns off the cut-off circuit and disconnects the main power from the protection element." Note that when the switch 102 is turned off, the protection circuit 100 of Oglesbee continues to receive power from the power supply 110.

Accordingly, claim 11 is nonobvious in view of Oglesbee.

Although the language of claim 13 is not identical to that of claim 7, the allowability of claim 13 will be apparent in view of the above discussion of claim 7.

Although the language of new claim 14 is not identical to that of claim 4, the allowability of claim 14 will be apparent in view of the above discussion of claim 4. Claims 14-20 are allowable because they depend on claim 14 and because they recite additional details of the switching element, cut-off thyristors, thermal detection element, and control thyristors which are not taught or suggested by Oglesbee.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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